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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/943,714	08/30/2001	Paul P. Chominski	2661P055	1354

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BLAKELY SOKOLOFF TAYLOR & ZAFMAN
12400 WILSHIRE BOULEVARD
SEVENTH FLOOR
LOS ANGELES, CA 90025-1030

EXAMINER

GENACK, MATTHEW W

ART UNIT

PAPER NUMBER

2645

DATE MAILED: 06/17/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/943,714

Applicant(s)

CHOMINSKI, PAUL P.

Examiner

Matthew W. Genack

Art Unit

2645

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-13 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-13 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 30 August 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. ____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 30 August 2001.
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____.
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: ____.

DETAILED ACTION

Drawings

1. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference character(s) not mentioned in the description: "66" and "74" of Fig. 1. Corrected drawing sheets in compliance with 37 CFR 1.121(d), or amendment to the specification to add the reference character(s) in the description in compliance with 37 CFR 1.121(b) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

2. The drawings are objected to because "70" is referred to as a power amplifier in the specification, while it is drawn as a filter in Fig. 1, and "72" is referred to as an antenna in the specification, while it is drawn as an amplifier in Fig. 1. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an

Art Unit: 2645

amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claim 6 recites the phrase "said circuit" in Line 1. There is insufficient antecedent basis for this limitation in the Claim because Claim 4 (upon which Claim 5 depends), makes reference to two circuits, a square root circuit and a squaring circuit. Examiner interprets the Claim such that the former is being referred to in Claim 6.

5. Where applicant acts as his or her own lexicographer to specifically define a term of a claim contrary to its ordinary meaning, the written description must clearly redefine the claim term and set forth the uncommon definition so as to put one reasonably skilled in the art on notice that the applicant intended to so redefine that claim term. *Process Control Corp. v. HydReclaim Corp.*, 190 F.3d 1350, 1357, 52 USPQ2d 1029, 1033 (Fed.

Cir. 1999). The phrase "process a baseband signal to be modulated at a frequency lower than a baseband frequency" in Claim 9 is used by the Claim to imply that baseband is not the lowest frequency band, while the accepted meaning of "baseband" is the lowest frequency range. The term is indefinite because the specification does not clearly redefine the term. Examiner interprets the Claim such that the phrase in question is replaced with "process a baseband signal".

6. Claim 13 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The phrase "The transmitter according to claim 12 for the comprising variable gain means for controlling gain" is not grammatically correct. Examiner interprets Claim such that the phrase in question is replaced with "The transmitter according to claim 12 comprising variable gain means for controlling gain". Examiner interprets Claim 4 such that the phrase in question is replaced with "a square root circuit for providing a modulation input signal for a modulator."

Claim Rejections - 35 USC § 102

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

8. Claims 1-2 and 9 are rejected under 35 U.S.C. 102(e) as being anticipated by McCarty, Jr., U.S. Patent Application Publication 2002/0136288.

Regarding Claim 1, McCarty Jr. discloses a circuit in which analog and digital data, after processing, is inputted to square root circuits, said square root circuits inputting into digital-to-analog converters (DACs), said DACs inputting into a modulator ([0039] Lines 1-12, [0040] Lines 1-28, Fig. 7). Examiner interprets said modulator to be a direct conversion modulator because each of the two parallel paths involves only one mixer, both mixers also being associated with the same local oscillator.

Regarding Claim 2, McCarty Jr. discloses that the square root circuits are digital signal processors ([0040] Lines 1-10, Fig. 7).

Regarding Claim 9, McCarty Jr. discloses a transmission circuit in which analog and digital data, after processing, is inputted to square root circuits, said square root circuits inputting into digital-to-analog converters (DACs), said DACs inputting into a modulator ([0039] Lines 1-12, [0040] Lines 1-28, Fig. 7). Examiner interprets said modulator to be a direct conversion modulator because each of the two parallel paths involves only one mixer, both mixers also being associated with the same local oscillator. Therefore, said transmission circuit is interpreted as a direct conversion transmitter. The analog and digital data is baseband data because McCarty Jr. discloses that the receiver circuit performs the reverse functions of the transmitter circuit and that said receiver circuit recovers the baseband signals, indicating that the transmitter processes and upconverts baseband signals.

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. Claims 1-3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Burgin, U.S. Patent No. 6,298,096, in view of Arnstein, U.S. Patent No. 6,047,023.

Regarding Claim 1, Burgin discloses a transmit modulator with a predistortion block that pre-compensates for errors introduced by the modulator (Abstract, Column 3 Lines 48-51). The apparatus of the invention comprises a direct conversion quadrature modulator (Figs. 1A-1B, Column 13 Lines 30-33), as well as a digital signal processor (Column 7 Lines 60-64, Fig. 2). The digital signal processor provides input signals into the direct conversion modulator (Fig. 2).

Burgin does not expressly disclose the use of the square root function.

Arnstein discloses a signal processing circuit that performs the square root function using either a digital or an analog technique (Column 13 Lines 8-11, Fig. 6).

At the time that the invention was made, it would have been obvious to one of ordinary skill in the art to modify the invention of Burgin by providing the means for the performance of the square root function by the signal processor on input signals to the direct conversion modulator.

One of ordinary skill in the art would have been motivated to make this modification because the square root function is the complement of the squaring function, and the latter function is useful in increasing dynamic range and gain control.

Regarding Claims 2-3, Arnstein discloses a signal processing circuit that performs the square root function using either a digital or an analog technique, as mentioned above.

11. Claims 4-5 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rofougaran *et. al.*, U.S. Patent No. 6,738,601, in view of Arnstein, further in view of Magoon *et. al.*, U.S. Patent 6,658,066.

Regarding Claim 4, Rofougaran *et. al.* discloses an adaptive radio transceiver (Abstract, Column 5 Lines 41-46), said transceiver comprising a direct conversion transmitter. The transceiver provides an input signal at a baseband frequency (Column 8 Lines 33-39, Fig. 2). A wide tuning range VCO of the transceiver comprises transconductance cells that have variable gain (Column 37 Lines 20-42, Fig. 34). Square-law rectifiers (circuits that square the input voltage and multiply it by a constant) are used in the transceiver (Column 20 Lines 25-30, Fig. 14). The transceiver's dynamic range can be adjusted with gain control of a low noise amplifier, said low noise amplifier coupled to an antenna (Figs. 1-2, Column 7 Line 65 to Column 8 Line 4).

Rofougaran *et. al.* does not expressly disclose the use of a square root circuit, nor the use of a local oscillator that provides one half of the transmission frequency.

Arnstein discloses a signal processing circuit that performs the square root function using either a digital or an analog technique (Column 13 Lines 8-11, Fig. 6).

At the time that the invention was made, it would have been obvious to one of ordinary skill in the art to modify the invention of Rofougaran *et. al.* by incorporating a square root circuit for processing modulator input.

One of ordinary skill in the art would have been motivated to make this modification because the square root function is the complement of the squaring function, and the latter function is useful in increasing dynamic range and gain control.

Neither Rofougaran *et. al.* nor Arnstein expressly discloses the use of a local oscillator that provides one half of the transmission frequency.

Magoon *et. al.* discloses a method and apparatus for generating modulation signals from a local oscillator signal for modulation of an information signal (Abstract, Column 2 Lines 11-14). A local oscillator operates at one half of the information signal frequency and inputs its signal into two modulators, or mixers (Column 3 Lines 7-16, Fig. 1).

At the time that the invention was made, it would have been obvious to one of ordinary skill in the art to modify the invention of Rofougaran *et. al.*, as modified by Arnstein by adding a modulator, said modulator comprising a local oscillator operating at one half of the transmission frequency, and said modulator receiving input from the square root circuitry, said modulator outputting to the squaring circuitry and the variable gain stage.

One of ordinary skill in the art would have been motivated to make this modification because of the reduction in modulation distortion and the increase in dynamic range that such a combination of features can achieve.

Regarding Claim 5, Rofougaran *et. al.*, in view of Arnstein, further in view of Magoon *et. al.* discloses every limitation of Claim 4, upon which Claim 5 depends, as outlined above. Furthermore, Rofougaran *et. al.* discloses the processing of in-phase (I)

and quadrature-phase (Q) signals (Column 6 Lines 8-17). Additionally, Rofougaran *et. al.* discloses the presence of Gilbert cells, acting as mixers (and thus modulators), in the transceiver (Column 25 Line 62 to Column 26 Line 3, Column 31 Lines 41-51, Figs. 23 and 31).

Regarding Claim 7, Rofougaran *et. al.*, in view of Arnstein, further in view of Magoon *et. al.* discloses every limitation of Claim 5, upon which Claim 7 depends, as outlined above. Furthermore, Arnstein discloses an analog signal processing circuit that performs the square root function (Column 2 Lines 30-36).

12. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Rofougaran *et. al.*, in view of Arnstein, further in view of Magoon *et. al.*, further in view of Burgin.

Rofougaran *et. al.*, in view of Arnstein, further in view of Magoon *et. al.* discloses every limitation of Claim 4, upon which Claim 6 depends, as outlined above. Additionally, Arnstein discloses a signal processing circuit that performs the square root function (Column 2 Lines 30-36).

Neither Rofougaran *et. al.*, nor Arnstein, nor Magoon *et. al.* expressly discloses a digital signal processor that performs the square root function.

Burgin discloses a digital signal processor (Column 7 Lines 60-64, Fig. 2). The digital signal processor provides input signals into the direct conversion modulator (Fig. 2).

At the time that the invention was made, it would have been obvious to one of ordinary skill in the art to modify the invention of Rofougaran *et. al.*, as modified by

Arnstein, as modified by Magoon *et. al.* by providing the means for the performance of the square root function by a digital signal processor on input signals to the direct conversion modulator.

One of ordinary skill in the art would have been motivated to make this modification because of the high fidelity inherent in the transmission and processing of digital signals.

13. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Rofougaran *et. al.*, in view of Arnstein, further in view of Magoon *et. al.*, further in view of Burgin, further in view of Kub *et. al.*, U.S. Patent Application Publication 2002/0032570.

Rofougaran *et. al.*, in view of Arnstein, further in view of Magoon *et. al.* discloses every limitation of Claim 6, upon which Claim 8 depends, as outlined above.

Neither Rofougaran *et. al.*, nor Arnstein, nor Magoon *et. al.*, nor Burgin expressly discloses a squaring circuit comprising a Gilbert multiplier.

Kub *et. al.* discloses Gilbert multipliers that performing the squaring function ([0013] Lines 7-8, [0028] Lines 7-9).

At the time that the invention was made, it would have been obvious to one of ordinary skill in the art to modify the invention of Rofougaran *et. al.*, as modified by Arnstein, as modified by Magoon *et. al.*, as modified by Burgin by incorporating Gilbert multipliers into the transceiver for the purpose of performing the squaring function.

One of ordinary skill in the art would have been motivated to make this modification because of the relatively high computational speed of Gilbert multipliers.

14. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Rofougaran *et. al.* in view of Arnstein.

Rofougaran *et. al.* discloses an adaptive radio transceiver (Abstract, Column 5 Lines 41-46), said transceiver comprising a direct conversion transmitter. The transceiver provides an input signal at a baseband frequency (Column 8 Lines 33-39, Fig. 2).

Rofougaran *et. al.* does not expressly disclose the use of a square root circuit.

Arnstein discloses a signal processing circuit that performs the square root function using either a digital or an analog technique (Column 13 Lines 8-11, Fig. 6).

At the time that the invention was made, it would have been obvious to one of ordinary skill in the art to modify the invention of Rofougaran *et. al.* by incorporating a square root circuit for processing modulator input.

One of ordinary skill in the art would have been motivated to make this modification because the square root function is the complement of the squaring function, and the latter function is useful in increasing dynamic range and gain control.

15. Claims 10-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rofougaran *et. al.* in view of Arnstein, further in view of Magoon *et. al.*

Rofougaran *et. al.* in view of Arnstein discloses every limitation of Claim 9, upon which Claim 10 depends, as outlined above.

Neither Rofougaran *et. al.* nor Arnstein expressly discloses the use of a local oscillator that provides one half of the transmission frequency.

Magoon *et. al.* discloses a method and apparatus for generating modulation signals from a local oscillator signal for modulation of an information signal (Abstract, Column 2 Lines 11-14). A local oscillator operates at one half of the information signal frequency and inputs its signal into two modulators, or mixers (Column 3 Lines 7-16, Fig. 1).

At the time that the invention was made, it would have been obvious to one of ordinary skill in the art to modify the invention of Rofougaran *et. al.*, as modified by Arnstein by adding a modulator, said modulator comprising a local oscillator operating at one half of the transmission frequency, and said modulator receiving input from the square root circuitry, said modulator outputting to the squaring circuitry and the variable gain stage.

One of ordinary skill in the art would have been motivated to make this modification because of the reduction in modulation distortion and the increase in dynamic range that such a combination of features can achieve.

Regarding Claims 11-13, Rofougaran *et. al.* in view of Arnstein, further in view of Magoon *et. al.* discloses every limitation of Claim 10, upon which Claims 11-13 depend, as outlined above. Additionally, Rofougaran *et. al.* discloses that a wide tuning range VCO of the transceiver comprises transconductance cells that have variable gain (Column 37 Lines 20-42, Fig. 34). Square-law rectifiers (circuits that square the input voltage and multiply it by a constant) are used in the transceiver (Column 20 Lines 25-30, Fig. 14). The transceiver's dynamic range can be adjusted with gain control of a low

Art Unit: 2645

noise amplifier, said low noise amplifier coupled to an antenna (Figs. 1-2, Column 7 Line 65 to Column 8 Line 4).

Conclusion

16. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Matthew W. Genack whose telephone number is 571-272-7541. The examiner can normally be reached on FLEX.

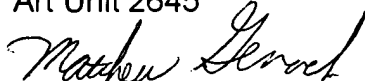
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Fan Tsang can be reached on 571-272-7547. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

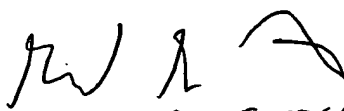
Matthew Genack

Examiner

Art Unit 2645



7 June 2005



ROUND G. FOSTER
PRIMARY PATENT EXAMINER